Supplemental Guide: Cardiovascular Disease

ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Cardiovascular Disease Milestones. This is not designed to indicate any specific requirements for each level, but to provide insight into the thinking of the Milestone Work Group.

Included in this document is the intent of each Milestone and examples of what a Clinical Competency Committee (CCC) might expect to be observed/assessed at each level. Also included are suggested assessment models and tools for each subcompetency, references, and other useful information.

Review this guide with the CCC and faculty members. As the program develops a shared mental model of the Milestones, consider creating an individualized guide (Supplemental Guide Template available) with institution/program-specific examples, assessment tools used by the program, and curricular components.

Additional tools and references, including the Milestones Guidebook, Clinical Competency Committee Guidebook, and Milestones Guidebook for Residents and Fellows, are available on the Resources page of the Milestones section of the ACGME website.

Patient Care 1: Invasive Cardiovascular Testing **Overall Intent:** To interpret angiographic and hemodynamic data; to perform invasive cardiac procedures with appropriate supervision	
Milestones	**Examples**
Level 1 *Discusses the key steps and anatomy relevant to the procedure*	● Describes venous and arterial anatomy
Level 2 *Obtains and manages vascular access, with direct supervision* *Recognizes normal coronary anatomy and standard angiographic views*	● Performs an Allen or Barbeau test ● Obtains vascular access ● Identifies left and right coronary anatomy in different projections
Level 3 *Performs some elements of diagnostic cardiac catheterization, with direct supervision* *Performs some elements of selected common procedures, with direct supervision* *Interprets angiographic and hemodynamic data, with supervision*	● Operates the manifold or injector ● Requires assistance to place right heart catheter ● Recognizes normal wave forms
Level 4 *Performs diagnostic cardiac catheterization, with direct supervision* *Independently performs selected common procedures (e.g., pulmonary artery catheter, temporary pacing wire, arterial and venous access)* *Independently interprets angiographic and hemodynamic data and integrates with other clinical findings for common clinical conditions*	● Performs all essential steps of diagnostic cardiac catheterization ● Independently places right heart catheter ● Recognizes and interprets abnormal wave forms and hemodynamic measurements to identify cardiogenic shock
Level 5 *Independently performs diagnostic cardiac catheterization* *Independently interprets angiographic and hemodynamic data and integrates with other clinical findings for complex clinical conditions*	● Independently performs diagnostic cardiac catheterization ● Independently interprets hemodynamic measurements in complex congenital heart disease
Assessment Models or Tools	● Direct observation

	● End-of-rotation evaluations ● Evaluation of conference presentation ● Procedure logs
Curriculum Mapping	●
Notes or Resources	● Milestones Level 4 is intended to reflect COCATS Level 1 ● King SB III, Babb JD, Bates ER, et al. COCATS 4 Task Force 10: training in cardiac catheterization. *J Am Coll Cardiol*. 2015;65(17):1844-1853. https://www.sciencedirect.com/science/article/pii/S0735109715008335?via%3Dihub. 2019. ● Halperin JL, Williams ES, Fuster V, et al. ACC 2015 core cardiovascular training statement 4 (COCATS 4) (revision of COCATS 3). *J Am Coll Cardiol*. 2015;65(17):1721–1906. https://www.acc.org/~/media/non-clinical/files-pdfs-excel-ms-word-etc/guidelines/2015/031315_cocats4_unified_document.pdf. 2019.

Patient Care 2: Non-Invasive Testing **Overall Intent:** To independently perform and interpret non-invasive testing and integrate data into patient care	
Milestones	**Examples**
Level 1 *Discusses the key steps of the test* *Interprets electrocardiogram (ECG) patterns for common clinical conditions*	● Describes steps to perform transthoracic echo ● Identifies acute ST elevation myocardial infarction (MI) and atrial fibrillation on a surface ECG
Level 2 *Obtains and identifies standard views for transthoracic echocardiography* *Participates in selected common tests, with direct supervision* *Interprets ECG and ambulatory ECG; performs and interprets stress testing, with guidance*	● Performs basic views of a transthoracic echocardiogram ● Aids in performance of cardiac nuclear perfusion testing ● Identifies ischemia on exercise stress test
Level 3 *Performs and interprets a complete transthoracic echocardiography, with guidance* *Integrates data from selected common tests (e.g., nuclear, computed tomography [CT], magnetic resonance imaging [MRI], vascular ultrasound), with guidance* *Interprets complex ECG, ambulatory ECG, and stress testing, with guidance*	● Interprets a normal, complete transthoracic echogram ● Recognizes the implications of high-risk features of a stress/rest cardiac nuclear perfusion test ● Discriminates between ventricular tachycardia and supraventricular tachycardia with aberrancy
Level 4 *Independently performs and interprets transthoracic echocardiography in common clinical conditions* *Independently integrates the data from selected common tests (e.g., nuclear, CT, MRI, vascular ultrasound)* *Independently interprets ECG and ambulatory ECG; independently performs and interprets stress testing*	● Independently interprets a transthoracic echocardiogram with uncomplicated aortic stenosis ● Independently recognizes the implications of high-risk features of a stress/rest cardiac nuclear perfusion test

Level 5 *Independently performs and interprets transthoracic echocardiography in complex clinical conditions* *Independently performs, interprets, and integrates selected common tests (e.g., nuclear, CT, MRI, vascular ultrasound)*	● Independently interprets a transthoracic echocardiogram with low flow, low gradient aortic stenosis ● Independently interprets stress/rest cardiac nuclear perfusion test
Assessment Models or Tools	● Direct observation ● End-of-rotation evaluations ● Evaluation of imaging conference participation ● Procedure logs
Curriculum Mapping	●
Notes or Resources	● Milestones Level 4 is intended to reflect COCATS Level 1 ● Ryan T, Berlacher K, Lindner JR, Mankad SV, Rose GA, Wang A. COCATS 4 task force 5: training in echocardiography. *J Am Coll Cardiol*. 2015;65(17):1786–1799. https://reader.elsevier.com/reader/sd/pii/S0735109715008487?token=09C8FB5B97F702BEE9F3719BA87B83ED51EDBFFFE2889A563201FABEE4E1596355E365FA59434C0BD648EE9A35EA20AE. 2019. ● Dilsizian V, Arrighi JA, Cohen RS, Miller TD, Solomon AJ, Udelson JE. COCATS 4 task force 6: training in nuclear cardiology. *J Am Coll Cardiol*. 2015;65(17):1800–1809. http://www.onlinejacc.org/content/65/17/1800. 2019. ● Halperin JL, Williams ES, Fuster V, et al. ACC 2015 core cardiovascular training statement 4 (COCATS 4) (revision of COCATS 3). *J Am Coll Cardiol*. 2015;65(17):1721–1906. https://www.acc.org/~/media/non-clinical/files-pdfs-excel-ms-word-etc/guidelines/2015/031315_cocats4_unified_document.pdf. 2019.

Patient Care 3: Acute Care **Overall Intent:** To diagnose and treat critically ill patients in an inpatient setting; to effectively perform hospital-based cardiology consultations	
Milestones	**Examples**
Level 1 *Identifies patients with acute cardiac conditions (e.g., acute coronary syndromes, cardiogenic shock, decompensated heart failure, arrhythmias)*	● Recognizes when to escalate care or admit to the intensive care unit (ICU) ● Recognizes cardiogenic shock from other etiologies of shock
Level 2 *Manages patients with acute cardiac conditions (e.g., acute coronary syndromes, cardiogenic shock, decompensated heart failure, and arrhythmias), with direct supervision* *Performs inpatient cardiovascular consultation, with direct supervision* *Identifies options available for advanced therapies*	● With direct supervision, implements treatment algorithms in patients with cardiogenic shock (including appropriate pressor/inotrope therapies) ● With direct supervision, diagnoses ventricular tachycardia and proceeds with diagnostic and therapeutic interventions ● Is aware of therapeutic options including transplant and ventricular assist devices
Level 3 *Manages patients with acute cardiac conditions (e.g., acute coronary syndromes, cardiogenic shock, decompensated heart failure, and arrhythmias), with indirect supervision* *Performs inpatient cardiovascular consultation, with indirect supervision* *Identifies patients appropriate for advanced therapies and when to initiate end-of-life care*	● With indirect supervision, implements treatment algorithms in patients with cardiogenic shock (including appropriate pressor / inotrope therapies) ● With indirect supervision, diagnoses ventricular tachycardia and proceeds with diagnostic and therapeutic interventions ● Recognizes when to consider evaluation for home inotropes
Level 4 *Manages independently patients with acute cardiac conditions (e.g., acute coronary syndromes, cardiogenic shock, decompensated heart failure, and arrhythmias)* *Effectively performs inpatient cardiovascular consultation*	● Independently, implements treatment algorithms in patients with cardiogenic shock (including appropriate pressor / inotrope therapies) ● Independently diagnoses ventricular tachycardia and proceeds with diagnostic and therapeutic interventions

Coordinates advanced therapies and end-of-life care	● Activates the services to initiate cardiac mechanical support in appropriate patients
Level 5 *Functions as an exceptional team leader in the acute care setting* *Advances quality of clinical practice in the treatment strategies for acute cardiovascular conditions* *Effectively develops team-based care models in management of acute cardiovascular conditions*	● Role models leadership in multidisciplinary care rounding in the cardiac care unit ● Develops initiatives to improve health care delivery in the acute setting ● Develops initiatives for improved team-based care
Assessment Models or Tools	● Direct observation ● End-of-rotation evaluations ● Evaluation of conference discussion during morning report ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Fuster V, Halperin JL, Williams ES, et al. COCATS 4 Task Force 1: training in ambulatory, consultative, and longitudinal cardiovascular care. *J Am Coll of Cardiol*. 2015;65(17):1734-1753. https://reader.elsevier.com/reader/sd/pii/S073510971500830X?token=033734DB203D1E84D925581F5CF1C05EDEBDC93137DBC103196CD7B4D5A8510D6C3ED0038B52056B7026D2FDF291493A. 2019. ● Jessup M, Ardehali R, Konstam MA, et al. COCATS 4 Task Force 12: training in heart failure. *J Am Coll Cardiol*. 2015;65(17):1866-1876. https://reader.elsevier.com/reader/sd/pii/S0735109715008384?token=558CD66A0E67EE965530368195DBBFA6CAD9C840B187CAEE89D8D23ECDC43CD5B5322F9F38054E6B331A8365CC752C5D. 2019. ● O'Gara PT, Adams JE III, Drazner MH, et al. COCATS 4 Task Force 13: training in cirtical care cardiology. *J Am Coll Cardiol*. 2015;65(17):1877-1886. https://reader.elsevier.com/reader/sd/pii/S0735109715008347?token=F5D9657F3C919D62CE118C2CDDAFEBC4DCE39C0822902301F86455DEA8F7D7EFA1A7513C4DB69C5EC326CECE07A1DB80. 2019. ● Halperin JL, Williams ES, Fuster V, et al. ACC 2015 core cardiovascular training statement 4 (COCATS 4) (revision of COCATS 3). *J Am Coll Cardiol*. 2015;65(17):1721–1906. https://www.acc.org/~/media/non-clinical/files-pdfs-excel-ms-word-etc/guidelines/2015/031315_cocats4_unified_document.pdf. 2019.

	● Braun LT, Grady KL, Kutner JS, et al. Palliative care and cardiovascular disease and stroke: a policy statement from the American Heart Association/American Stroke Association. *Circulation*. 2016;134(11):e198-225. https://www.ahajournals.org/doi/full/10.1161/CIR.0000000000000438. 2019.

Patient Care 4: Chronic Care for Cardiovascular Conditions **Overall Intent:** To assess, diagnose, and manage chronic cardiovascular conditions (e.g., heart failure, atrial fibrillation, ischemic heart disease, etc.)	
Milestones	**Examples**
Level 1 *Recognizes clinical signs and symptoms of common chronic cardiovascular conditions*	● Recognizes symptoms, signs and laboratory findings consistent with heart failure
Discusses the treatment strategies for common cardiovascular conditions	● Discusses the guideline based treatments appropriate for heart failure with reduced ejection fraction
Level 2 *Diagnoses and monitors for complications or changes related to common chronic cardiovascular conditions, with direct supervision*	● Monitors symptoms, signs, and laboratory findings for evidence of progression of heart failure and develops an appropriate differential diagnosis, with direct supervision
Develops treatment strategies for common chronic cardiovascular conditions, with direct supervision	● Develops pharmacologic treatment plans for patients with heart failure with reduced ejection fraction, with direct supervision
Effectively participates in team-based care in management of common chronic cardiovascular conditions, with direct supervision	● Appropriately engages with pharmacists, social workers, case managers, and other consultants in the management of heart failure patients, with direct supervision
Level 3 *Diagnoses and monitors for complications or changes related to common chronic cardiovascular conditions, with indirect supervision*	● Monitors symptoms, signs, and laboratory findings for evidence of progression of heart failure and develops an appropriate differential, with indirect supervision from faculty members
Develops treatment strategies for common chronic cardiovascular conditions, with indirect supervision	● Develops pharmacologic treatment plans for patients with heart failure with reduced ejection fraction, with indirect supervision from faculty members
Effectively participates in team-based care in management of common chronic cardiovascular conditions, with indirect supervision	● Appropriately engages with pharmacists, social workers, case managers, and other consultants in the management of heart failure patients, with indirect supervision from faculty members
Level 4 *Diagnoses and monitors for complications or changes related to complex chronic cardiovascular conditions*	● Diagnoses and monitors for concurrent cardiovascular conditions such as valvular heart disease, arrhythmia, and pulmonary hypertension

Develops treatment strategies for complex chronic cardiovascular conditions *Effectively participates in team-based care in management of complex chronic cardiovascular conditions*	● Independently able to manage patients with heart failure with reduced ejection fraction and valvular heart disease, arrhythmia, or pulmonary hypertension ● Engages with the heart failure specialists for consideration of advanced therapies
Level 5 *Functions as an exceptional team leader in the chronic care setting* *Advances quality of clinical practice in the treatment strategies for chronic cardiovascular conditions* *Effectively develops team-based care models in management of chronic cardiovascular conditions*	● Coordinates interdisciplinary care for complex patients with multiple comorbidities ● Engages in community events to promote the health of patients with chronic cardiac conditions ● Develops initiatives with other health care professionals to improve dietary adherence recommendations in heart failure
Assessment Models or Tools	● Direct observation ● End-of-rotation assessments ● Individual performance metrics from electronic health records (EHR) ● Multisource feedback ● Research/quality assurance project presentations
Curriculum Mapping	●
Notes or Resources	● Halperin JL, Williams ES, Fuster V, et al. ACC 2015 core cardiovascular training statement 4 (COCATS 4) (revision of COCATS 3). *J Am Coll Cardiol*. 2015;65(17):1721–1906. https://www.acc.org/~/media/non-clinical/files-pdfs-excel-ms-word-etc/guidelines/2015/031315_cocats4_unified_document.pdf. 2019.

Medical Knowledge 1: Cardiovascular Testing **Overall Intent:** To identify and interpret relevant cardiovascular tests for different clinical situations	
Milestones	**Examples**
Level 1 *Knows available cardiovascular tests*	● Lists the cardiovascular tests that can be used to evaluate for coronary artery disease
Level 2 *Demonstrates knowledge of indications and contraindications for cardiovascular testing* *Knows the basic measurements obtained from the various cardiovascular testing modalities*	● Knows the indications, risks and contraindications of stress testing for patients with suspected coronary artery disease ● Knows that a nuclear stress test measures relative myocardial perfusion
Level 3 *Demonstrates knowledge of appropriate selection and use of cardiovascular testing for patients with common cardiovascular disorders* *Identifies key test findings in common cardiovascular disorders*	● Knows the role of and characteristic findings on echocardiography of dilated and hypertrophic cardiomyopathy ● Recognizes the presence of pericardial effusion and knows echocardiographic criteria for tamponade
Level 4 *Applies knowledge of appropriate selection and use of cardiovascular testing for patients with complex cardiovascular disorders* *Identifies key test findings in complex cardiovascular disorders*	● Differentiates between constriction and restriction on echocardiography ● Knows the key findings in cardiopulmonary exercise testing (CPET) in patients evaluated for cardiac transplantation ● Chooses appropriate cardiac imaging tests to diagnose cardiac amyloidosis
Level 5 *Advances knowledge in indications, contraindications, and appropriate use for cardiovascular testing* *Advances knowledge in defining the role of cardiovascular testing*	● Participates in local or national research efforts surrounding multimodality imaging ● Participate in guidelines development on the role of CPET
Assessment Models or Tools	● Direct observation ● Evaluation of case presentation ● In-training exam ● Medical record (chart) audit ● Multisource feedback ● Procedure log
Curriculum Mapping	●
Notes or Resources	● Halperin JL, Williams ES, Fuster V, et al. ACC 2015 core cardiovascular training statement 4 (COCATS 4) (revision of COCATS 3). *J Am Coll Cardiol*. 2015;65(17):1721–

	1906. https://www.acc.org/~/media/non-clinical/files-pdfs-excel-ms-word-etc/guidelines/2015/031315_cocats4_unified_document.pdf. 2019.

Medical Knowledge 2: Critical Thinking for Diagnosis and Therapy **Overall Intent:** To diagnose rare presentations and disorders and appropriately adapt treatment plans	
Milestones	**Examples**
Level 1 *Lists a differential diagnosis for common clinical presentations* *Lists therapeutic options for common clinical presentations*	● Lists a differential diagnosis for chest pain ● Lists treatment options for chronic angina
Level 2 *Provides a comprehensive differential diagnosis for a wide range of clinical presentations* *Explains advantages and drawbacks of standard therapeutic options*	● Creates a complete differential for chest pain in several different clinical scenarios ● Discusses risks and benefits of medical versus invasive management of chronic angina
Level 3 *Provides a focused differential diagnosis based on individual patient presentation* *Justifies optimal therapeutic option based on individual patient presentation*	● Creates a differential diagnosis for chest pain in pregnancy ● Explains rationale for medical management in chronic angina associated with chronic kidney disease
Level 4 *Diagnoses patients with challenging presentations and uncommon disorders* *Develops therapeutic plan for patients with challenging presentations and uncommon disorders*	● Synthesizes history and physical and diagnostic testing in spontaneous coronary artery dissection in pregnancy ● Creates therapeutic plan for a patient with anomalous coronary and chest pain
Level 5 *Disseminates knowledge of challenging presentations and uncommon disorders*	● Writes a case report on spontaneous coronary artery dissection ● Performs research on innovative therapy for chronic angina
Assessment Models or Tools	● Direct observation ● End-of-rotation evaluation ● Evaluation of conference participation
Curriculum Mapping	●
Notes or Resources	● Clinical reasoning relies on appropriate foundational knowledge that requires the learner to apply that knowledge in a thoughtful, deliberate, and logical fashion to clinical cases to inform clinical care

	● Iobst WF, Trowbride R, Philibert I. Teaching and assessing critical reasoning through the use of entrustment. *J Grad Med Educ*. 2013;5(3):517-518. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3771188/. 2019.

Systems-Based Practice 1: Patient Safety and Quality Improvement (QI) **Overall Intent:** To engage in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals; to conduct a QI project	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of common patient safety events* *Demonstrates knowledge of how to report patient safety events* *Demonstrates knowledge of basic quality improvement methodologies and metrics*	● Describes the basics of reporting pathways and QI strategies, but has not yet participated in such activities
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)* *Describes quality improvement initiatives at the institutional or departmental level*	● Identifies and reports a patient safety issue (e.g., accidental discontinuation of dual antiplatelet agents after percutaneous coronary intervention), along with contributing system factors ● Is aware of available hospital and departmental reporting mechanisms for near-misses
Level 3 *Participates in analysis of patient safety events (simulated or actual)* *Participates in disclosure of patient safety events to patients and families (simulated or actual)* *Participates in quality improvement initiatives at the institutional or departmental level*	● Reviews a patient safety event (e.g., preparing for morbidity and mortality presentations, joining a Root Cause Analysis group) and has communicated with patients/families about such an event ● Participates in a QI project, though they may not have yet designed a QI project
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)* *Discloses patient safety events to patients and families (simulated or actual)*	● Collaborates with a team to lead the analysis of a patient safety event and can competently communicate with patients/families about those events ● Initiates and completes a QI project within the cardiology division or department

Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project	
Level 5 *Actively engages teams and processes to modify systems to prevent patient safety events* *Role models or mentors others in the disclosure of patient safety events* *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	● Competently assumes a leadership role at the institutional or community level for patient safety and/or QI initiatives, possibly even being the person to initiate action or call attention to the need for action
Assessment Models or Tools	● Chart or other system documentation by fellow ● Direct observation ● Documentation of QI or patient safety project processes or outcomes ● E-module multiple choice tests ● Portfolio ● Reflection ● Simulation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Institute for Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2019.

Systems-Based Practice 2: System Navigation for Patient-Centered Care **Overall Intent:** To effectively navigate the health care system, including the interdisciplinary team and other care providers; to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of care coordination*	● Identifies the various members of the health care team and defines their roles
Identifies key elements for effective transitions of care	● Lists the essential components of an effective sign-out and care transition
Level 2 *Coordinates care of patients in routine clinical situations, effectively using the roles of the interprofessional teams*	● Contacts health care team members for routine cases, but requires supervision to ensure all necessary referrals, testing, and care transitions are made
Performs effective transitions of care in routine clinical situations	● Performs a routine case sign-out but still needs guidance and direct supervision to identify and appropriately triage cases or calls
Demonstrates general knowledge of financial, cultural, and social barriers to adherence of care	● Identifies components of social determinants of health and how they impact the delivery of patient care
Level 3 *Coordinates care of patients in complex clinical situations, effectively using the roles of their interprofessional teams*	● Uses care coordinators to help prevent patients with chronic congestive heart failure from frequent admissions
Performs effective transitions of care in complex clinical situations	● Performs safe and effective transitions of care with clinical service at shift change
Identifies financial, cultural, and social barriers to adherence of care to specific populations	● Knows which patients are at high risk for specific health outcomes related to health literacy concerns, cost of testing or therapy, LGBTQ status, etc.
Level 4 *Role models effective coordination of patient-centered care among different disciplines and specialties*	● Role models and educates students and junior team members regarding the engagement of appropriate interprofessional team members and ensures the necessary resources have been arranged
Role models and advocates for effective transitions of care within and across health care delivery systems	● Coaches residents on effective transition from the inpatient to outpatient setting
Adapts practice to address the financial, cultural, and social barriers to adherence of care	● Adjusts practice to ensure patients with lower income are prescribed lower cost medications

Level 5 *Analyses the process of care coordination and leads in the design and implementation of improvements* *Improves quality of transitions of care within and across healthcare delivery systems to optimize patient outcomes* *Leads innovations and advocates for populations with health care inequities*	● Works with hospital or ambulatory site team members or leadership to analyze care coordination in that setting, and takes a leadership role in designing and implementing changes to improve the care coordination ● Works with a QI mentor to identify better hand-off tools for on-call services ● Designs a social determinants of health curriculum to help others learn to identify local resources and barriers to care and laboratory testing; ● Helps develop telehealth program to ensure that patients in rural areas can be seen by all cardiology specialists
Assessment Models or Tools	● Case management quality metrics and goals mined from EHRs ● Direct observation ● Interdisciplinary rounds for high-risk patients/cases ● Lectures/workshops on social determinants of health or population health with identification of local resources ● Medical record (chart) review ● Multisource feedback ● Review of sign-out tools, use and review of checklists between pathology services
Curriculum Mapping	●
Notes or Resources	● Adams C. In pursuit of patient-centered care. *MLO*. 2016;48(4):48. https://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. 2019. ● CDC. Population Health Training in Place Program (PH-TIPP). https://www.cdc.gov/pophealthtraining/whatis.html. 2019. ● Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. 1st ed. Philadelphia, PA: Elsevier; 2016. https://commerce.ama-assn.org/store/ui/catalog/productDetail?product_id=prod2780003. 2019.

Systems-Based Practice 3: Physician Role in Health Care Systems **Overall Intent:** To understand the physician's role in the complex health care system and how to optimize the system to improve patient care and the health system's performance	
Milestones	**Examples**
Level 1 *Identifies key components of the health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)* *Describes basic health payment systems, (e.g., government, private, public, uninsured care) and practice models*	● Recognizes that hospitals, skilled nursing facilities, and technology are components of the health care system and describes different payment systems, such as Medicare, Medicaid, the VA, and commercial third-party payers
Level 2 *Describes how components of a complex health care system are inter-related, and how this impacts patient care* *Delivers care with consideration of each patient's payment model (e.g., insurance type)* *Demonstrates essential skills for documentation required for independent practice (e.g., electronic health record, documentation required for billing and coding)*	● Describes how improving patient satisfaction improves patient adherence and remuneration to the health system ● Applies knowledge of health plan features, including formularies and network requirements in patient care situations ● Completes a note template following a routine patient encounter and applies appropriate coding in compliance with regulations
Level 3 *Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)* *Engages with patients in shared decision making, informed by each patient's payment models* *Seeks knowledge in non-clinical topics needed for independent practice (e.g., malpractice insurance, government regulation, compliance)*	● Understands, accesses, and analyzes performance data at departmental or individual level; relevant data may include: ○ MI mortality from national registry ○ Group's heart failure readmission rates ○ Wait time for initial visit to the fellow's cardiology clinic ● Uses shared decision making to select the most cost-effective testing depending on the relevant clinical needs ● Understands the process of contract negotiations and choosing malpractice insurance carriers and features
Level 4 *Manages various components of the complex health care system to provide efficient and effective patient care and transition of care*	● Works collaboratively with the institution to improve patient assistance resources or design the institution's community health needs assessment, or develop/implement/assess the resulting action plans

Advocates for patient care needs (e.g., community resources, patient assistance resources) with consideration of the limitations of each patient's payment model *Applies knowledge in non-clinical topics needed for independent practice*	● Applies knowledge of contract negotiations and choosing malpractice insurance carriers and features,
Level 5 *Advocates for or leads systems change that enhances high-value, efficient and effective patient care and transition of care* *Participates in health policy advocacy activities* *Educates others in non-clinical topics to prepare them for independent practice*	● Works with community or professional organizations to advocate for no smoking ordinances ● Develops processes to decrease opioid prescribing for one or more clinical services ● Improves informed consent process for non-English speaking patients requiring interpreter services
Assessment Models or Tools	● Direct observation ● Medical record (chart) review ● QI project
Curriculum Mapping	●
Notes or Resources	● Center for Medicare and Medicaid Services. 2018 MIPS Advancing Care Information Performance Category Fact Sheet. https://www.cms.gov/Medicare/Quality-Payment-Program/Resource-Library/2018-Advancing-Care-information-Fact-Sheet.pdf. 2019. ● Center for Medicare and Medicaid Services. MACRA. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-MIPS-and-APMs.html. 2019. ● Agency for Healthcare Research and Quality (AHRQ). The Challenges of Measuring Physician Quality. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/challenges.html. 2019. ● AHRQ. Major Physician Performance Sets. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. 2019. ● The Kaiser Family Foundation. www.kff.org. 2019. ● The Kaiser Family Foundation. Health Reform. https://www.kff.org/topic/health-reform/. 2019. ● Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities form a national academy of medicine initiative. *JAMA*. 2017;317(14):1461-1470. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. 2019.

	● The Commonwealth Fund. Health System Data Center. http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. 2019. ● The Commonwealth Fund. Health Reform Resource Center: http://www.commonwealthfund.org/interactives-and-data/health-reform-resource-center#/f:@facasubcategoriesfacet63677=[Individual%20and%20Employer%20Responsibility. 2019. ● American Board of Internal Medicine. QI/PI activities. http://www.abim.org/maintenance-of-certification/earning-points/practice-assessment.aspx. 2019.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice **Overall Intent:** To incorporate evidence and patient values into clinical practice	
Milestones	**Examples**
Level 1 *Demonstrates how to access and use available evidence to manage a patient with cardiac disease*	● Obtains the appropriate evidence-based guidelines for management of aortic regurgitation
Level 2 *Articulates clinical questions and elicits patient preferences to guide evidence-based care*	● Asks symptom driven and goals of care questions of the patient with aortic regurgitation
Level 3 *Locates and applies the best available evidence to the care of patients with complex cardiac disease while integrating patient preference*	● Applies evidence in the care of a patient with symptomatic, severe aortic regurgitation who does not want surgery ● Researches and applies the concept of frailty in the evaluation of a patient with severe aortic stenosis
Level 4 *Critically appraises and applies available, potentially conflicting evidence to guide care of an individual patient*	● Applies evidence, including new primary literature, in the care of a patient with severe aortic regurgitation due to endocarditis in the setting of drug use
Level 5 *Develops initiatives to educate others to critically appraise and apply evidence for complex patients and/or participates in the development of guidelines*	● Teaches others how to find and apply best practice or develops, independently or as a part of a team, thoughtful clinical guidelines on management of valve disease ● Helps write a multi-team policy for the institution to address when to do surgery in patients with endocarditis and recent drug use
Assessment Models or Tools	● Direct observation ● Evaluation of presentation ● Oral or written examination
Curriculum Mapping	●
Notes or Resources	● NEJM Knowledge. Exploring the ACGME Core Competencies: Practice-Based Learning and Improvement. https://knowledgeplus.nejm.org/blog/practice-based-learning-and-improvement/. 2019. ● Harrington RA, Barac A, Brush JE Jr, et al. COCATS 4 Task Force 15: training in cardiovascular research and scholarly activity. *J Am Coll Cardiol*. 2015;65(17):1899-1906. https://www.sciencedirect.com/science/article/pii/S0735109715008396?via%3Dihub. 2019. ● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. *Acad Pediatr*. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/fulltext. 2019.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth **Overall Intent:** To seek performance information with the intent to improve care; to reflect on all domains of practice and develop goals for improvement	
Milestones	**Examples**
Level 1 *Accepts responsibility for personal and professional development by establishing goals* *Acknowledges limits and gaps between expectations and performance; demonstrates self-awareness*	● Sets goal to independently interpret transthoracic echocardiogram in tamponade ● Acknowledges need to improve skills in obtaining adequate images to assess for tamponade
Level 2 *Demonstrates openness to feedback and performance data in order to form goals* *Analyzes the factors which contribute to limits and gaps; demonstrates appropriate help-seeking behaviors*	● Appreciative of feedback from on call attending on interpretation of quality of echocardiogram and sets goal to improve quality of echo in next month
Level 3 *Occasionally seeks feedback and performance data with adaptability and humility* *Creates and implements a learning plan*	● Documents goals in a more specific and achievable manner, such that attaining them is reasonable and measurable
Level 4 *Systematically seeks feedback and performance data with adaptability and humility* *Uses performance data to assess learning plan and improves it when necessary*	● At the end of each week with an attending, asks him/her about performance and opportunities for improvement ● Consistently identifies ongoing gaps and chooses areas for further development
Level 5 *Coaches others to seek feedback and performance data* *Facilitates the design and implementation of learning plans for others*	● Encourages other learners on the team to develop a learning plan ● Develops a form that all fellows can use to document and implement a learning plan based on In-Training Exam results
Assessment Models or Tools	● Direct observation ● End-of-rotation evaluations ● Review of learning plan
Curriculum Mapping	●
Notes or Resources	● Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Acad Med.* 2009;84(8):1066-74. https://insights.ovid.com/crossref?an=00001888-200908000-00021. 2019.

	● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. Acad Pediatr. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/fulltext. 2019. ● Lockspeiser TM, Schmitter PA, Lane JL, Hanson JL, Rosenberg AA, Park YS. Assessing residents' written learning goals and goal writing skill: validity evidence for the learning goal scoring rubric. Acad Med. 2013;88(10):1558-1563. https://insights.ovid.com/article/00001888-201310000-00039. 2019.

Professionalism 1: Professional Behavior and Ethical Principles **Overall Intent:** To recognize and address lapses in ethical and professional behavior, demonstrates ethical and professional behaviors, and use appropriate resources for managing ethical and professional dilemmas	
Milestones	**Examples**
Level 1 *Identifies and describes potential triggers for professionalism lapses* *Demonstrates knowledge of ethical principles (e.g., informed consent, advance directives, confidentiality, patient autonomy)*	● Identifies and describes potential personal or group triggers for professionalism lapses, describes when and how to appropriately report professionalism lapses, and outlines strategies for addressing common barriers to reporting ● Discusses the basic principles underlying ethics (beneficence, nonmaleficence, justice, autonomy) and professionalism (professional values and commitments), and how they apply in various situations (e.g., informed consent process)
Level 2 *Demonstrates insight into professional behavior in routine situations* *Applies knowledge of ethical principles to routine situations*	● Acknowledges a lapse without becoming defensive, making excuses, or blaming others ● Apologizes for the lapse when appropriate and takes steps to make amends if needed ● Articulates strategies for preventing similar lapses in the future ● Recognizes and responds appropriately when peers seek coverage of a shift due to fatigue
Level 3 *Demonstrates professional behavior in complex or stressful situations* *Recognizes need to seek help in managing and resolving complex ethical situations*	● Behaves respectfully and calmly during an interaction between the health care team and a distraught or angry family member ● Recognizes own limitations and seeks resources to help manage and resolve complex ethical situations such as: ○ consulting with a genetic counselor about the implications of genetic testing ○ requesting an ethics consult (e.g., Jehovah's Witness patient with potential transfusion needs)
Level 4 *Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in self and others* *Uses appropriate resources for managing and resolving ethical dilemmas (e.g., ethics consultations, risk management)*	● Anticipates the need to seek additional resources to prevent ethical dilemmas ● Models respect for patients and expects the same from others ● Successfully leads a difficult conversation between the health care team and a distraught or angry family member outlines and responds to possible ethical issues when writing and submitting an Institutional Review Board (IRB) review for a research project
Level 5 *Coaches others when their behavior fails to meet professional expectations* *Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution*	● Coaches a resident in the cardiovascular ICU after a difficult interaction with a nurse led to a heated discussion in front of a patient family ● Seeks opportunities to provide appropriate feedback on professionalism to other members of the health care team ● Engages in system-wide efforts to improve professionalism through participation in a work group, committee, or task force
Assessment Models or Tools	● Direct observation

	● Global evaluation ● Multisource feedback ● Oral or written self-reflection (e.g., of a personal or observed lapse, ethical dilemma, or systems-level factors) ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2019. ● ABIM Foundation. American Board of Internal Medicine. Medical professionalism in the new millennium: a physician charter. *Annals of Internal Medicine*. 2002;136(3):243-246. https://annals.org/aim/fullarticle/474090/medical-professionalism-new-millennium-physician-charter. 2019. ● Domen RE, Johnson K, Conran RM, et al. Professionalism in pathology: a case-based approach as a potential education tool. *Arch Pathol Lab Med*. 2017;141(2):215-219. https://www.archivesofpathology.org/doi/10.5858/arpa.2016-0217-CP?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2019. ● Byyny RL, Papadakis MA, Paauw DS, Pfiel S, Alpha Omega Alpha. *Medical Professionalism Best Practices*. Menlo Park, CA: Alpha Omega Alpha Honor Medical Society; 2015. https://alphaomegaalpha.org/pdfs/2015MedicalProfessionalism.pdf. 2019. ● Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. New York, NY: McGraw-Hill Education; 2014. https://accessmedicine.mhmedical.com/book.aspx?bookID=1058. 2019. ● Bynny RL, Paauw DS, Papadakis MA, Pfeil S, Alpha Omega Alpha. *Medical Professionalism Best Practices: Professionalism in the Modern Era.* Menlo Park, CA: Alpha Omega Alpha Honor Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. 2019.

Professionalism 2: Accountability **Overall Intent:** To take responsibility for one's own actions and the impact on patients and other members of the health care team, as well as recognizes and manages potential conflicts of interest	
Milestones	**Examples**
Level 1 *Takes responsibility for failure to complete tasks and responsibilities, identifies potential contributing factors, and describes strategies for ensuring timely task completion in the future* *Recognizes the principles of conflict of interest in relationships with industry and other entities*	● Responds promptly to reminders from program administrator to complete work hour logs ● Timely attendance at conferences ● Understands the potential conflict of interests in relationships with pharmaceutical and device companies
Level 2 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations* *Recognizes personal potential conflicts with industry*	● Completes tasks in a timely manner, with attention to detail and recognizes when he/she will have trouble completing that task (e.g., going out of town) ● Completes and documents safety modules, procedure review, and licensing requirements (e.g., administrative duties and tasks) ● Understands the potential conflict of interest in receiving gifts and educational resources from pharmaceutical and device companies
Level 3 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations* *Seeks assistance in managing personal relationships with industry and other entities to minimize bias and undue influence in practice*	● Appropriately notifies residents and fellows on day service about overnight call events during transition of care or hand-off in order to avoid patient safety issues and compromise of patient care ● Completes tasks in stressful situations and preempts issues that would impede completion of tasks (e.g., notifies attending of multiple competing demands on call, appropriately triages tasks, and asks for assistance from other residents or faculty members, if needed) ● Reviews case logs, evaluations, and portfolio and develops a learning plan to address gaps/weakness in knowledge, case exposure, and skills ● In collaboration with peers and supervisors, reviews and critiques promotional materials provided by pharmaceutical and device representatives ● Follows institutional policies regarding relationships with industry
Level 4 *Recognizes situations that may impact others' ability to complete tasks and responsibilities in a timely manner*	● Identifies issues that could impede other residents and fellows from completing tasks and provides leadership to address those issues (e.g., senior fellows advise junior fellows how to manage their time in completing patient care tasks ● Takes responsibility for potential adverse outcomes and professionally discusses with the interprofessional team

Identifies, discloses, and manages relationships with industry and other entities to minimize bias and undue influence in practice	● Independently reviews and critiques promotional materials provided by pharmaceutical and device representatives
Level 5 *Engages with the system to improve outcomes*	● Identifies and addresses team/system issues that impede efficient completion of patient care tasks (setting up a meeting with the nurse manager to streamline patient discharges) ● Leads multidisciplinary team in a Root Cause Analysis
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Multisource feedback ● Self-evaluations and reflective tools ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Society of Anesthesiologists. Standards and Guidelines. https://www.asahq.org/standards-and-guidelines. 2019. ● Code of conduct from fellow/resident institutional manual ● Expectations of residency program regarding accountability and professionalism

Professionalism 3: Self-Awareness and Well-Being **Overall Intent:** To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	
Milestones	**Examples**
Level 1 *Recognizes the importance of personal and professional well-being*	● Accepts responsibility of monitoring his/her well-being
Level 2 *Independently recognizes status of personal and professional well-being*	● Identifies possible sources of personal stress and independently seeks help
Level 3 *With assistance, proposes a plan to optimize personal and professional well-being*	● With assistance, develops an action plan to address sources of burnout for self or team
Level 4 *Independently develops a plan to optimize personal and professional well-being*	● Independently develops action plans for continued personal and professional growth, and limits stress and burnout for self or team
Level 5 *Participates in a system change to improve well-being in self and others*	● Mentors patients and colleagues in self-awareness and establishes health management plans to limit stress and burnout
Assessment Models or Tools	● Direct observation ● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules ● Participation in institutional well-being programs ● Self-assessment and personal learning plan
Curriculum Mapping	●
Notes or Resources	● This subcompetency is not intended to evaluate a fellow's well-being, but to ensure each fellow has the fundamental knowledge of factors that impact well-being, the mechanisms by which those factors impact well-being, and available resources and tools to improve well-being. ● Local resources, including Employee Assistance Plan (EAP) ● Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: personal and professional development. *Acad Pediatr*. 2014;14(2 Suppl):S80-97. https://www.academicpedsjnl.net/article/S1876-2859(13)00332-X/fulltext. 2019. ● ACGME. "Well-Being Tools and Resources." https://dl.acgme.org/pages/well-being-tools-resources. 2019.

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication **Overall Intent:** To use language and behaviors to form constructive relationships with patients, identifies communication barriers including self-reflection on personal biases, and minimizes them in the doctor-patient relationships; to organize and lead communication around shared decision making	
Milestones	**Examples**
Level 1 *Demonstrates respect and establishes rapport in patient encounters* *Knows barriers to effective communication (e.g., language, disability, health literacy, cultural, personal bias)* *Identifies the need to adjust communication strategies to achieve shared decision making*	● Self-monitors and controls tone, non-verbal responses, and language and asks questions to invite patient/family participation ● Can list examples of common communication barriers in patient care ● Avoids medical jargon when talking to patients
Level 2 *Establishes a therapeutic relationship in routine patient encounters* *Identifies barriers to effective communication in patient encounters* *Organizes and initiates communication with patient/family to facilitate shared decision making*	● Develops a professional relationship with patients/families, with active listening and attention to communication barriers in patient and family encounters ● Takes the lead in organizing a meeting time and agenda with the patient, family, and consulting teams; begins the meeting, reassessing patient and family understanding and anxiety
Level 3 *Establishes a therapeutic relationship in challenging patient encounters, with guidance* *Attempts to minimize communication barriers, including reflection on any personal biases* *Uses shared decision making to implement a personalized care plan, under guidance*	● Establishes and maintains a therapeutic relationship with a challenging patient and can articulate personal challenges in the relationship, how their personal biases may impact the relationship, and strategies to use going forward ● Attempts to mitigate identified communication barriers, including reflection on implicit biases when prompted ● Elicits what is most important to the patient and family, and acknowledges uncertainty in the medical complexity and prognosis
Level 4 *Independently establishes a therapeutic relationship in challenging patient encounters* *Proactively minimizes communication barriers and independently manages personal biases*	● Independently establishes a therapeutic relationship with the most challenging or complex patients/families with extra sensitivity to their specific concerns ● Anticipates and proactively addresses communication barriers, including recognition of own implicit bias

Independently, uses shared decision making to implement a personalized care plan	● Engages in shared decision making process with the patient and family, including a recommended plan to align patient's unique goals with treatment options
Level 5 *Mentors others in situational awareness and critical self-reflection to consistently develop positive therapeutic relationships* *Role models self-awareness to minimize communication barriers* *Role models shared decision making*	● Role models and supports colleagues in self-awareness and reflection to improve therapeutic relationships with patients ● Role models proactive self-awareness and reflection around explicit and implicit biases with a context specific approach to mitigate communication barriers ● Is an example to others of leading shared decision making with clear recommendations to patients and families even in more complex clinical situations
Assessment Models or Tools	● Direct observation ● Kalamazoo Essential Elements Communication Checklist (Adapted) ● Multisource feedback ● Self-assessment including self-reflection exercises ● Skills needed to set the state, Elicit information, Give information, Understand the patient, and End the encounter (SEGUE) ● Standardized patients or structured case discussions
Curriculum Mapping	●
Notes or Resources	● Lane JL, Gottlieb RP. Structured clinical observations: a method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105(4 Pt 2):973-977. https://www.ncbi.nlm.nih.gov/pubmed/10742358. 2019. ● Braddock CH III, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: time to get back to basics. *JAMA*. 1999;282(24):2313-2320. https://jamanetwork.com/journals/jama/fullarticle/192233. 2019. ● Laidlaw A, Hart J. Communication skills: an essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. *Med Teach*. 2011;33(1):6-8. https://www.researchgate.net/publication/49706184_Communication_skills_An_essential_component_of_medical_curricula_Part_I_Assessment_of_clinical_communication_AMEE_Guide_No_511. 2019. ● Makoul G. Essential elements of communication in medical encounters: The Kalamazoo consensus statement. *Acad Med*. 2001;76(4):390-393. https://www.researchgate.net/publication/264544600_Essential_elements_of_communication_in_medical_encounters_The_Kalamazoo_Consensus_Statement. 2019. ● Makoul G. The SEGUE Framework for teaching and assessing communication skills. *Patient Educ Couns*. 2001;45(1):23-34.

	https://www.researchgate.net/publication/11748796_The_SEGUE_Framework_for_teaching_and_assessing_communication_skills. 2019. ● Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. *BMC Med Educ*. 2009;9:1. https://bmcmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1. 2019.

Interpersonal and Communication Skills 2: Interprofessional and Team Communication **Overall Intent:** To effectively communicate with the health care team, including consultants, in both routine and complex situations	
Milestones	**Examples**
Level 1 *Respectfully receives a consultation request* *Uses language that values all members of the health care team*	● Shows respect through words and actions when receiving calls for assistance from members of the health care team ● Uses respectful communication to clerical and technical staff members ● Listens to and considers others' points of view, is nonjudgmental and actively engaged, and demonstrates humility
Level 2 *Respectfully and thoroughly completes consultations with effective documentation and communication in common cases, with direct supervision* *Communicates information effectively with all health care team members* *Participates in team-based discussions to optimize team performance*	● Demonstrates active listening by fully focusing on the speaker (other health care provider, patient), actively showing verbal and non-verbal signs (eye contact, posture, reflection, questioning, summarization) ● Communicates clearly and concisely in an organized and timely manner during consultant encounters, as well as with the health care team in general ● Participates in multi-disciplinary discussions regarding treatment for particular patients
Level 3 *Completes consultations with effective documentation and communication in common cases, with indirect supervision* *Adapts communication style to fit team needs* *Initiates team-based discussions to optimize team performance*	● Respectfully provides feedback to junior members of the medical team for the purposes of improvement or reinforcement of correct knowledge, skills, and attitudes ● Uses teach-back or other strategies to assess and receive understanding during consultations ● Arranges and facilitates multi-disciplinary discussions regarding treatment for particular patients, under supervision
Level 4 *Completes consultations with effective documentation and communication in complex cases* *Coordinates recommendations from different members of the health care team to optimize patient care* *Facilitates team-based discussions to optimize team performance*	● Communicates recommendations effectively and in a timely manner with primary care and other referring or collaborating members of the health care team ● Arranges and leads multi-disciplinary discussions regarding treatment for complex cases

Level 5 *Role models flexible communication strategies that value input from all health care team members, resolving conflict when needed* *Facilitates regular health care team-based feedback in complex situations*	● Guides others in organizing effective team meetings to resolve conflict
Assessment Models or Tools	● Direct observation ● Global assessment ● Multisource feedback ● Medical record (chart) review ● Simulation encounters
Curriculum Mapping	●
Notes or Resources	● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Med Teach.* 2018:1-4. https://www.tandfonline.com/doi/full/10.1080/0142159X.2018.1481499. 2019. ● Green M, Parrott T, Cook G. Improving your communication skills. *BMJ*. 2012;344:e357. https://www.bmj.com/content/344/bmj.e357. 2019. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. *Med Teach*. 2013;35(5):395-403. https://www.tandfonline.com/doi/full/10.3109/0142159X.2013.769677. 2019. ● François J. Tool to assess the quality of consultation and referral request letters in family medicine. *Can Fam Physician*. 2011;57(5):574–575. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093595/. 2019. ● Fay D, Mazzone M, Douglas L, Ambuel B. A validated, behavior-based evaluation instrument for family medicine residents. *MedEdPORTAL*. 2007. https://www.mededportal.org/publication/622/. 2019. ● Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL*. 2015;11:10174. https://www.mededportal.org/publication/10174/. 2019. ● Lane JL, Gottlieb RP. Structured clinical observations: a method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105(4 Pt 2):973-977. https://www.ncbi.nlm.nih.gov/pubmed/10742358. 2019. ● Braddock CH III, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: time to get back to basics. *JAMA*. 1999;282(24):2313-2320. https://jamanetwork.com/journals/jama/fullarticle/192233. 2019.

Interpersonal and Communication Skills 3: Communication within Health Care Systems **Overall Intent:** To effectively communicate using a variety of methods	
Milestones	**Examples**
Level 1 *Accurately records information in the patient record and safeguards patient personal health information*	● Notes are accurate but may lack organization and include extraneous information ● Only uses methods of communication that are HIPAA compliant to transmit patients' health information
Level 2 *Demonstrates organized diagnostic and therapeutic reasoning through notes in the patient record* *Identifies appropriate communication channels (e.g., cell phone/ pager usage, medical record, email) as required by institutional policy*	● Notes are organized and accurate but may still contain extraneous information ● Identifies method for sharing results needing urgent attention ● Recognizes that a communication breakdown has happened and respectfully brings the breakdown to the attention of the chief resident or faculty member
Level 3 *Concisely reports diagnostic and therapeutic reasoning in the patient record* *Respectfully communicates concerns about the system*	● Documentation is accurate, organized, and concise, but may not consistently contain anticipatory (if/then) guidance ● Communicates opportunities for improvement in the EHR interface
Level 4 *Independently communicates timely information in a written format and verbally when appropriate* *Uses appropriate channels to offer clear and constructive suggestions to improve the system*	● Writes a clear and concise note and transmits verbally critical information to a colleague ● Knows when to call the treating team about unexpected or critical findings of clinical significance ● Participates in task force to update policy for sharing abnormal results
Level 5 *Models written communication to improve others' performance* *Guides departmental or institutional communication around policies and procedures*	● Leads a task force established by the hospital QI committee to develop a plan to improve house staff hand-offs ● Teaches colleagues how to improve discharge summaries
Assessment Models or Tools	● Direct observation ● Medical record (chart) review ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: validity evidence for a checklist to assess progress notes in the

	electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. 2019. ● Starmer AJ, Spector ND, Srivastava R, et al. I-PASS, a mnemonic to standardize verbal handoffs. *Pediatrics*. 2012;129(2):201-204. https://ipassinstitute.com/wp-content/uploads/2016/06/I-PASS-mnemonic.pdf. 2019. ● Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf*. 2006;32(3)167-175. https://www.ncbi.nlm.nih.gov/pubmed/16617948. 2019.

Available Milestones Resources

Milestones 2.0: Assessment, Implementation, and Clinical Competency Committees Supplement, 2021 - *https://meridian.allenpress.com/jgme/issue/13/2s*

Milestones Guidebooks: https://www.acgme.org/milestones/resources/

- *Assessment Guidebook*
- *Clinical Competency Committee Guidebook*
- *Clinical Competency Committee Guidebook Executive Summaries*
- *Implementation Guidebook*
- *Milestones Guidebook*

Milestones Guidebook for Residents and Fellows: https://www.acgme.org/residents-and-fellows/the-acgme-for-residents-and-fellows/

- Milestones Guidebook for Residents and Fellows
- Milestones Guidebook for Residents and Fellows Presentation
- Milestones 2.0 Guide Sheet for Residents and Fellows

Milestones Research and Reports: https://www.acgme.org/milestones/research/

- *Milestones National Report*, updated each fall
- *Milestones Predictive Probability Report,* updated each fall
- *Milestones Bibliography*, updated twice each year

Developing Faculty Competencies in Assessment courses - https://www.acgme.org/meetings-and-educational-activities/courses-and-workshops/developing-faculty-competencies-in-assessment/

Assessment Tool: Direct Observation of Clinical Care (DOCC) - https://dl.acgme.org/pages/assessment

Assessment Tool: Teamwork Effectiveness Assessment Module (TEAM) - https://team.acgme.org/

Improving Assessment Using Direct Observation Toolkit - https://dl.acgme.org/pages/acgme-faculty-development-toolkit-improving-assessment-using-direct-observation

Remediation Toolkit - https://dl.acgme.org/courses/acgme-remediation-toolkit

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